

U.S. Army Research, Development and Engineering Command



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Minimizing the Footprint of Deployed Bases: Army Approaches to Waste to Energy Conversion

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Select Waste to Energy Conversion (WEC) Systems in Development



If you're here today, you've probably heard of...

- Onsite Field-feeding Waste-to-Energy Converter (OFWEC)
- Tactical Garbage to Energy Refinery (TGER)
- Mobile Integrated Sustainable Energy Recovery (MISER)
- Green Pyrolyzer Gasifier (GPG)
- Integrated Battlefield Support System (IBSS)

You may not know much about...

- Green Energy Machine (GEM)
- Pyrolysis Waste Disposal System (PWDS)
- Military Encampment Waste to Electrical Power System (MEWEPS)
- High Energy Density Waste to Energy Converter (HEDWEC)





Onsite Field-feeding Waste-to-Energy Converter (OFWEC)



Agency: Natick Soldier RDE Center

Company: Community Power Corporation

Description:

- CPC BioMax® stratified downdraft gasifier
- Interfaces with 60 kW TQG
- Shredded feedstock has proven problematic
- Handles only paper and plastic (no wet food)
- Can be combined with Solid Waste
 Preprocessor to handle food

- Reliable long-term operation not demonstrated
- Future efforts expected to focus on other related systems







Tactical Garbage to Energy Refinery (TGER)



Agency: Edgewood Chemical Biological Center, Rapid Equipping Force

Company: Defense Life Sciences/Purdue University Description:

- CPC BioMax® stratified downdraft gasifier with bio fermenter and pelletizer
- Includes 60 kW gen-set (ethanol and producer gas used to displace JP-8)
- Designed to handle foodservice waste (including paper, plastic, and food)

- Current prototype field tested in Iraq with mixed results
- Further work needed to address issues







Mobile Integrated Sustainable Energy Recovery (MISER)



Agency: Defense Advanced Research Projects Agency

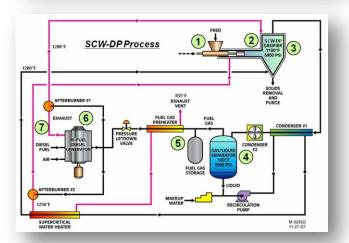
Company: General Atomics

Description:

- Supercritical water gasification
- High pressure, high temperature reactor
- 100 kW gen-set
- Prototype designed primarily for plastic, will be tested with mixed waste

- Being fabricated, reliable long-term operation not demonstrated
- Further work needed to address issues and reduce costs







Green Pyrolyzer Gasifier (GPG)



Agency: Natick Soldier RDE Center, Defense Advanced Research Projects Agency

Company: Green Liquid & Gas Technologies

Description:

- High-temperature pyrolytic gasification
- Very small scale

- Demonstrated with MRE and UGR packaging
- Will need ancillary equipment (shredder, gas and liquid cleanup, generator)
- Further development and engineering needed







Integrated Battlefield Support System (IBSS)



Agency: PM Force Sustainment Systems,

HQ-RDECOM

Company: QinetiQ

Description:

- Solid waste incinerator paired with waste water treatment and water generation technologies
- Incinerator and emissions clean-up housed in five ISO containers
- Incinerator destroys >4400 lbs mixed solid waste per day

- Demonstrated at Royal Engineer Training Area
- Further work needed to add energy recovery







Green Energy Machine (GEM)



Agency: Army Research Laboratory, Edgewood Chemical Biological Center, Tank-Automotive RDE Center

Company: InfoSciTex

Description:

- Stratified downdraft gasifier integrated with Solid Waste Preprocessor
- 120 kW gen-set
- Developed with private funding following related SBIR contracts
- Designed for up to 3 TPD waste

- Significant interest for non-military use
- Demonstration planned for Sep 2009







Pyrolysis Waste Disposal System (PWDS)



Agency: PM Force Sustainment Systems

Company: QinetiQ

Description:

- Also known as Pyrolysis Total Energy Converter (PyTEC)
- Pyrolysis plant with additional capabilities
- Designed for 220 lb/hr mixed waste
- Packaged in two ISO containers

- ST 150 pyrolysis plant installed on HMS Ocean and operating effectively
- Foreign Comparative Test being pursued to containerize and recover energy







Military Encampment Waste to Electrical Power System (MEWEPS)



Agency: Tank-Automotive RDE Center

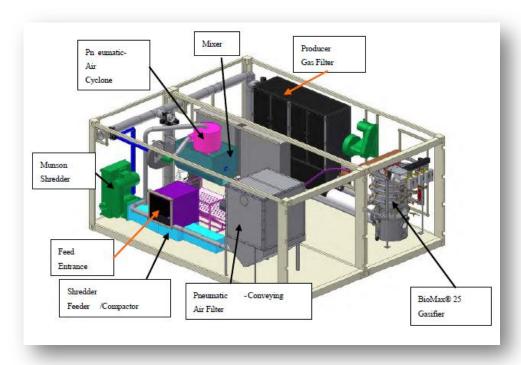
Company: NextEnergy,
Community Power Corporation

Description:

- CPC BioMax® Gasifier
- Interfaces with 60 kW TQG
- Shares much in common with OFWEC
- Adds gasifier design improvements and pelletizer
- Designed for paper and plastic, some food

Status:

 Being fabricated, reliable long-term operation not demonstrated





High Energy Density Waste to Energy Converter (HEDWEC)



Agency: Army Research Laboratory, Natick Soldier RDE Center

Company: Community Power Corporation **Description:**

- Shares much in common with OFWEC
- Larger gasifier (or multiple gasifiers) with pre-processor/pelletizer
- Interfaces with multiple 60 kW TQGs
- Intended to handle all solid waste

Status:

Awarded March 2009

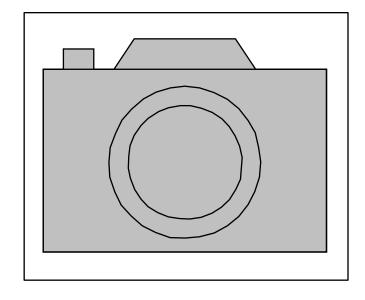
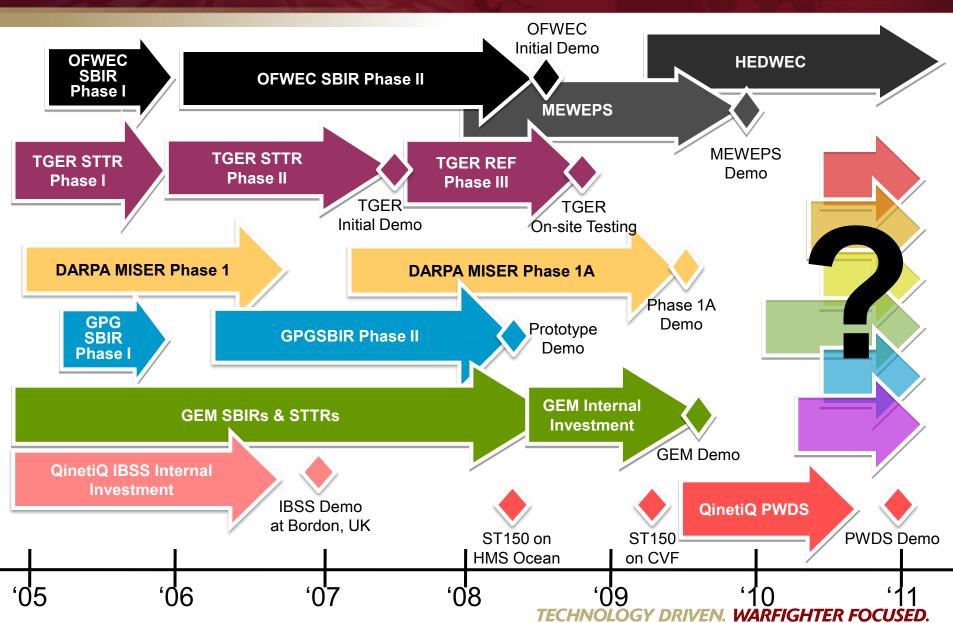


Image coming soon!



Technology Development History and Maturity









- Mr. John Munroe, PM Force Sustainment Systems
- Mr. Leigh Knowlton, Natick Soldier RDE Center
- Ms. Carol Wong, Hughes Associates, Inc.

My apologies to the dozens of other systems that might have applicability to the Army!